

[Sequence Listing]

<110> Takeda Chemical Industries, Ltd.

<120> Novel G protein-coupled receptor protein, its DNA and ligand thereof

<130> 2568USOP-CIP

<150> US 09/831,758

<151> 2001-05-11

<150> PCT/JP99/06283

<151> 1999-11-11

<150> JP 10-323759

<151> 1998-11-13

<150> JP 11-060030

<151> 1999-03-08

<150> JP 11-106812

<151> 1999-04-14

<150> JP 11-166672

<151> 1999-06-14

<150> JP 11-221640

<151> 1999-08-04

<150> JP 11-259818

<151> 1999-09-14

<160> 62

<210> 1

<211> 180

<212> PRT

<213> Human

<400> 1

```

Met Glu Ile Ile Ser Ser Lys Leu Phe Ile Leu Leu Thr Leu Ala Thr
 1      5      10      15
Ser Ser Leu Leu Thr Ser Asn Ile Phe Cys Ala Asp Glu Leu Val Met
 20      25      30
Ser Asn Leu His Ser Lys Glu Asn Tyr Asp Lys Tyr Ser Glu Pro Arg
 35      40      45
Gly Tyr Pro Lys Gly Glu Arg Ser Leu Asn Phe Glu Leu Lys Asp
 50      55      60
Trp Gly Pro Lys Asn Val Ile Lys Met Ser Thr Pro Ala Val Asn Lys
 65      70      75      80
Met Pro His Ser Phe Ala Asn Leu Pro Leu Arg Phe Gly Arg Asn Val
 85      90      95
Gln Glu Glu Arg Ser Ala Gly Ala Thr Ala Asn Leu Pro Leu Arg Ser
100      105      110
Gly Arg Asn Met Glu Val Ser Leu Val Arg Arg Val Pro Asn Leu Pro
115      120      125
Gln Arg Phe Gly Arg Thr Thr Thr Ala Lys Ser Val Cys Arg Met Leu
130      135      140
Ser Asp Leu Cys Gln Gly Ser Met His Ser Pro Cys Ala Asn Asp Leu
145      150      155      160
Phe Tyr Ser Met Thr Cys Gln His Gln Glu Ile Gln Asn Pro Asp Gln
165      170      175
Lys Gln Ser Arg
180

```

<210> 2

<211> 540

<212> DNA

<213> Human

<400> 2

```

atggaaatta tttcatcaaa actattcatt ttattgactt tagccacttc aagcttgtaa 60
acatcaaaca ttttttgtgc agatgaatta gtgatgtcca atcttcacag caaagaaaat 120
tatgacaaat attctgagcc tagaggatac ccaaaagggg aaagaagcct caattttgag 180
gaattaaaag attggggacc aaaaaatggt attaagatga gtacacctgc agtcaataaa 240
atgccacact ccttcgcca cttgccattg agatttggga ggaacgttca agaagaaaga 300
agtgcctggag caacagccaa cctgcctctg agatctgga agaatatgga ggtgagcctc 360

```

gtgagacgtg ttctaacct gcccacaaagg ttgggagaa caacaacagc caaaagtgc 420
 tgcaggatgc tgagtattt gtgtcaagga tccatgcatt caccatgtgc caatgactta 480
 tttactcca tgacctgcca gcaccaagaa atccagaatc ccgatcaaaa acagtcaagg 540

<210> 3
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 3
 gggctgcaca tagagactta attttag 27

<210> 4
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 4
 ctagaccacc tctatataac tgcccat 27

<210> 5
 <211> 30
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 5
 gcacatagag acttaatttt agatttagac 30

<210> 6
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 6
 catgcacttt gactggtttc caggtat 27

<210> 7
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 7
 cagctttagg gacaggctcc aggtttc 27

<210> 8
 <211> 196
 <212> PRT
 <213> Human

<400> 8
 Met Glu Ile Ile Ser Ser Lys Leu Phe Ile Leu Leu Thr Leu Ala Thr
 1 5 10 15
 Ser Ser Leu Leu Thr Ser Asn Ile Phe Cys Ala Asp Glu Leu Val Met
 20 25 30
 Ser Asn Leu His Ser Lys Glu Asn Tyr Asp Lys Tyr Ser Glu Pro Arg
 35 40 45
 Gly Tyr Pro Lys Gly Glu Arg Ser Leu Asn Phe Glu Glu Leu Lys Asp
 50 55 60
 Trp Gly Pro Lys Asn Val Ile Lys Met Ser Thr Pro Ala Val Asn Lys
 65 70 75 80
 Met Pro His Ser Phe Ala Asn Leu Pro Leu Arg Phe Gly Arg Asn Val
 85 90 95

Gln Glu Glu Arg Ser Ala Gly Ala Thr Ala Asn Leu Pro Leu Arg Ser
 100 105 110
 Gly Arg Asn Met Glu Val Ser Leu Val Arg Arg Val Pro Asn Leu Pro
 115 120 125
 Gln Arg Phe Gly Arg Thr Thr Thr Ala Lys Ser Val Cys Arg Met Leu
 130 135 140
 Ser Asp Leu Cys Gln Gly Ser Met His Ser Pro Cys Ala Asn Asp Leu
 145 150 155 160
 Phe Tyr Ser Met Thr Cys Gln His Gln Glu Ile Gln Asn Pro Asp Gln
 165 170 175
 Lys Gln Ser Arg Arg Leu Leu Phe Lys Lys Ile Asp Asp Ala Glu Leu
 180 185 190
 Lys Gln Glu Lys
 195

<210> 9
 <211> 588
 <212> DNA
 <213> Human

<400> 9
 atggaaatta tttcatcaaa actattcatt ttattgactt tagccacttc aagcttggtta 60
 acatcaaaca tttttgtgc agatgaatta gtgatgtcca atcttcacag caaagaaaat 120
 tatgacaaat attctgagcc tagaggatac ccaaaagggg aaagaagcct caattttgag 180
 gaattaaaag attggggacc aaaaaatgtt attaagatga gtacacctgc agtcaataaa 240
 atgccacact ccttcgccaa ctggccattg agatttggga ggaacgttca agaagaaaga 300
 agtgctggag caacagccaa cctgcctctg agatctggaa gaaatatgga ggtgagcctc 360
 gtgagacgtg ttctaacct gccccaaggg ttggggagaa caacaacagc caaaagtgtc 420
 tgcaggatgc tgagtattt gtgtcaagga tccatgcatt caccatgtgc caatgactta 480
 ttttactcca tgacctgcca gcaccaagaa atccagaatc ccatcaaaa acagtcaagg 540
 agactgctat tcaagaaaat agatgatgca gaattgaaac aagaaaaa 588

<210> 10
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 10
 gcctagagga gatctaggct gggagga 27

<210> 11
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 11
 gggaggaaca tggaagaaga aaggagc 27

<210> 12
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 12
 gatggatgaat gcatggactg ctggagc 27

<210> 13
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 13
 ttctcccaa atctcagtg caggttg 27

<210> 14

<211> 196
<212> PRT
<213> Bovine

<400> 14
Met Glu Ile Ile Ser Leu Lys Arg Phe Ile Leu Leu Met Leu Ala Thr
1 5 10 15
Ser Ser Leu Leu Thr Ser Asn Ile Phe Cys Thr Asp Glu Ser Arg Met
20 25 30
Pro Asn Leu Tyr Ser Lys Lys Asn Tyr Asp Lys Tyr Ser Glu Pro Arg
35 40 45
Gly Asp Leu Gly Trp Glu Lys Glu Arg Ser Leu Thr Phe Glu Glu Val
50 55 60
Lys Asp Trp Ala Pro Lys Ile Lys Met Asn Lys Pro Val Val Asn Lys
65 70 75 80
Met Pro Pro Ser Ala Ala Asn Leu Pro Leu Arg Phe Gly Arg Asn Met
85 90 95
Glu Glu Glu Arg Ser Thr Arg Ala Met Ala His Leu Pro Leu Arg Leu
100 105 110
Gly Lys Asn Arg Glu Asp Ser Leu Ser Arg Trp Val Pro Asn Leu Pro
115 120 125
Gln Arg Phe Gly Arg Thr Thr Ala Lys Ser Ile Thr Lys Thr Leu
130 135 140
Ser Asn Leu Leu Gln Gln Ser Met His Ser Pro Ser Thr Asn Gly Leu
145 150 155 160
Leu Tyr Ser Met Ala Cys Gln Pro Gln Glu Ile Gln Asn Pro Gly Gln
165 170 175
Lys Asn Leu Arg Arg Arg Gly Phe Gln Lys Ile Asp Asp Ala Glu Leu
180 185 190
Lys Gln Glu Lys
195

<210> 15
<211> 588
<212> DNA
<213> Bovine

<400> 15
atggaaatta tttcattaaa acgattcatt ttattgatgt tagccacttc aagcttgta 60
acatcaaaca tcttctgcac agacgaatca aggatgccca atctttacag caaaaagaat 120
tatgacaaat attccgagcc tagaggagat ctaggctggg agaaagaaag aagtcttact 180
tttgaagaag taaaagattg ggcttcaaaa attaatga ataaacctgt agtcaacaaa 240
atgccacatt ctgcagccaa cctgccactg agatttggga ggaacatgga agaagaaagg 300
agcactaggg cgatggccca ccctgcctctg agactcggaa aaaatagaga gacagcctc 360
tccagatggg tcccaaatct gcccagagg tttggaagaa caacaacagc caaaagcatt 420
accaagaccg tgagtaattt gctccagcag tccatgcatt caccatctac caatgggcta 480
ctctactcca tggcctgcca gcccgaagaa atccagaatc ctggtcaaaa gaacctaaagg 540
agacggggat tccagaaaaat agatgatgca gaattgaaac aagaaaaa 588

<210> 16
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 16
ccctggggct tcttctgtct tctatgt 27

<210> 17
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 17
agcgattcat ttatttgact ttagca 26

<210> 18
<211> 203
<212> PRT
<213> Rat

<400> 18

Met Glu Ile Ile Ser Ser Lys Arg Phe Ile Leu Leu Thr Leu Ala Thr
1 5 10 15
Ser Ser Phe Leu Thr Ser Asn Thr Leu Cys Ser Asp Glu Leu Met Met
20 25 30
Pro His Phe His Ser Lys Glu Gly Tyr Gly Lys Tyr Tyr Gln Leu Arg
35 40 45
Gly Ile Pro Lys Gly Val Lys Glu Arg Ser Val Thr Phe Gln Glu Leu
50 55 60
Lys Asp Trp Gly Ala Lys Lys Asp Ile Lys Met Ser Pro Ala Pro Ala
65 70 75 80
Asn Lys Val Pro His Ser Ala Ala Asn Leu Pro Leu Arg Phe Gly Arg
85 90 95
Asn Ile Glu Asp Arg Arg Ser Pro Arg Ala Arg Ala Asn Met Glu Ala
100 105 110
Gly Thr Met Ser His Phe Pro Ser Leu Pro Gln Arg Phe Gly Arg Thr
115 120 125
Thr Ala Arg Arg Ile Thr Lys Thr Leu Ala Gly Leu Pro Gln Lys Ser
130 135 140
Leu His Ser Leu Ala Ser Ser Glu Ser Leu Tyr Ala Met Thr Arg Gln
145 150 155 160
His Gln Glu Ile Gln Ser Pro Gly Gln Glu Pro Arg Lys Arg Val
165 170 175
Phe Thr Glu Thr Asp Asp Ala Glu Arg Lys Gln Glu Lys Ile Gly Asn
180 185 190
Leu Gln Pro Val Leu Gln Gly Ala Met Lys Leu
195 200

<210> 19
<211> 609
<212> DNA
<213> Rat

<400> 19
atggaaatta tttcatcaaa gcgattcatt ttattgactt tagcaacttc aagcttccta 60
acttcaaaca ccctttgttc agatgaatta atgatgcccc attttcacag caaagaaggt 120
tatggaaaat attaccagct gagaggaatc ccaaaagggg taaaggaaag aagtgtcact 180
tttcaagaac tcaaagattg gggggcaaaag aaagatatta agatgagtcc agcccctgcc 240
aacaagatgc ccacatcagc agccaacctt cccctgaggt ttggaggagg catagaagac 300
agaagaagcc ccagggcacg ggccaacatg gaggcaggga ccatgagcca ttttccagc 360
ctgccccaaa ggtttgggag aacaacagcc agacgcata ccaagacact gectggtttg 420
ccccagaaat ccctgcactc cctggcctcc agtgaatcgc tctatgccat gacccgccag 480
catcaagaaa ttcagagtc tggtaagag caacctagga aacgggtgtt cacggaaaca 540
gatgatgcag aaaggaaaca agaaaaaata ggaaacctcc agccagtcct tcaaggggct 600
atgaagctg 609

<210> 20
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> base sequence encoding RFGR sequence

<220>
<221> variation
<222> 3
<223> n means any of a, g, t or c.

<220>
<221> variation
<222> 9
<223> n means any of a, g, t or c.

<400> 20
mgnttyggna ar

12

<210> 21
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> base sequence encoding RSGK sequence

<220>
<221> variation
<222> 3

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 9

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 12

<223> n means any of a, g, t or c.

<400> 21

mgnttyggnm gn

12

<210> 22

<211> 12

<212> DNA

<213> Artificial Sequence

<220>

<223> base sequence encoding RSGR sequence

<220>

<221> variation

<222> 3

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 6

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 9

<223> n means any of a, g, t or c.

<400> 22

mgnwsnggna ar

12

<210> 23

<211> 12

<212> DNA

<213> Artificial Sequence

<220>

<223> base sequence encoding RLGK sequence

<220>

<221> variation

<222> 3

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 6

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 9

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 12

<223> n means any of a, g, t or c.

<400> 23

mgnwsnggnm gn

12

<210> 24

<211> 12

<212> DNA

<213> Artificial Sequence

<220>
<223> base sequence encoding RLKG sequence

<220>
<221> variation
<222> 3
<223> n means any of a, g, t or c.

<220>
<221> variation
<222> 6
<223> n means any of a, g, t or c.

<220>
<221> variation
<222> 9
<223> n means any of a, g, t or c.

<400> 24
mgnytnggna ar

12

<210> 25
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> base sequence encoding RLGR sequence

<220>
<221> variation
<222> 3
<223> n means any of a, g, t or c.

<220>
<221> variation
<222> 6
<223> n means any of a, g, t or c.

<220>
<221> variation
<222> 9
<223> n means any of a, g, t or c.

<220>
<221> variation
<222> 12
<223> n means any of a, g, t or c.

<400> 25
mgnytnggnm gn

12

<210> 26
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 26
gacttaattt tagatttaga caaatggaa

30

<210> 27
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 27
ttctccaaa ctttggggc aggtt

25

<210> 28
<211> 28
<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 28

acagcaaaga aggtgacgga aaatactc

28

<210> 29

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 29

atagatgaga aaagaagccc cgcagcac

28

<210> 30

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 30

gtgctgctggg gcttcttttc tcatttat

28

<210> 31

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 31

ttagactta gacgaaatgg a

21

<210> 32

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 32

gctccgtagc ctcttgaagt c

21

<210> 33

<211> 188

<212> PRT

<213> Mouse

<400> 33

Met Glu Ile Ile Ser Leu Lys Arg Phe Ile Leu Leu Thr Val Ala Thr
1 5 10 15
Ser Ser Phe Leu Thr Ser Asn Thr Phe Cys Thr Asp Glu Phe Met Met
20 25 30
Pro His Phe His Ser Lys Glu Gly Asp Gly Lys Tyr Ser Gln Leu Arg
35 40 45
Gly Ile Pro Lys Gly Glu Lys Glu Arg Ser Val Ser Phe Gln Glu Leu
50 55 60
Lys Asp Trp Gly Ala Lys Asn Val Ile Lys Met Ser Pro Ala Pro Ala
65 70 75 80
Asn Lys Val Pro His Ser Ala Ala Asn Leu Pro Leu Arg Phe Gly Arg
85 90 95
Thr Ile Asp Glu Lys Arg Ser Pro Ala Ala Arg Val Asn Met Glu Ala
100 105 110
Gly Thr Arg Ser His Phe Pro Ser Leu Pro Gln Arg Phe Gly Arg Thr
115 120 125
Thr Ala Arg Ser Pro Lys Thr Pro Ala Asp Leu Pro Gln Lys Pro Leu
130 135 140
His Ser Leu Gly Ser Ser Glu Leu Leu Tyr Val Met Ile Cys Gln His

145 150 155 160
 Gln Glu Ile Gln Ser Pro Gly Gly Lys Arg Thr Arg Arg Gly Ala Phe
 165 170 175
 Val Glu Thr Asp Asp Ala Glu Arg Lys Pro Glu Lys
 180 185

<210> 34
 <211> 564
 <212> DNA
 <213> Mouse

<400> 34
 atggaaatta tticattaaa acgattcatt ttattgactg tggcaacttc aagcttctta 60
 acatcaaaca ccttcgttac agatgagttc atgatgcctc attttcacag caaagaaggt 120
 gacggaaaaa acicccagct gagaggaatc ccaaaagggg aaaaggaaag aagtgtcagt 180
 ttccaagaac taaaagattg gggggcaaag aatgttatta agatgagtcc agcccttgcc 240
 aacaagatgc ccactcagc agccaacctg cccctgagat ttggaaggac catagatgag 300
 aaaagaagcc cgcagcacg ggtcaacatg gaggcaggga ccaggagcca ttccccagc 360
 ctgccccaaa ggtttgggag aacaacagcc agaagcccca agacaccgcg tgatttgcca 420
 cagaaacccc tgcactcact gggctccagc gagttgctct acgtcatgat ctgccagcac 480
 caagaatttc agagtcctgg tggaaagcga acgaggagag gagcgtttgt ggaaacagat 540
 gatgcagaaa ggaaaccaga aaaa 564

<210> 35
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 35
 agtcgacagt atggaggcgg agccctc 27

<210> 36
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 36
 gactagtcca aatgttccag gccgggatg 29

<210> 37
 <211> 432
 <212> PRT
 <213> Rat

<400> 37
 Met Glu Ala Glu Pro Ser Gln Pro Pro Asn Gly Ser Trp Pro Leu Gly
 5 10 15
 Gln Asn Gly Ser Asp Val Glu Thr Ser Met Ala Thr Ser Leu Thr Phe
 20 25 30
 Ser Ser Tyr Tyr Gln His Ser Ser Pro Val Ala Ala Met Phe Ile Ala
 35 40 45
 Ala Tyr Val Leu Ile Phe Leu Leu Cys Met Val Gly Asn Thr Leu Val
 50 55 60
 Cys Phe Ile Val Leu Lys Asn Arg His Met Arg Thr Val Thr Asn Met
 65 70 75 80
 Phe Ile Leu Asn Leu Ala Val Ser Asp Leu Leu Val Gly Ile Phe Cys
 85 90 95
 Met Pro Thr Thr Leu Val Asp Asn Leu Ile Thr Gly Trp Pro Phe Asp
 100 105 110
 Asn Ala Thr Cys Lys Met Ser Gly Leu Val Gln Gly Met Ser Val Ser
 115 120 125
 Ala Ser Val Phe Thr Leu Val Ala Ile Ala Val Glu Arg Phe Arg Cys
 130 135 140
 Ile Val His Pro Phe Arg Glu Lys Leu Thr Leu Arg Lys Ala Leu Phe
 145 150 155 160
 Thr Ile Ala Val Ile Trp Ala Leu Ala Leu Leu Ile Met Cys Pro Ser
 165 170 175
 Ala Val Thr Leu Thr Val Thr Arg Glu Glu His His Phe Met Leu Asp
 180 185 190
 Ala Arg Asn Arg Ser Tyr Pro Leu Tyr Ser Cys Trp Glu Ala Trp Pro
 195 200 205

Glu Lys Gly Met Arg Lys Val Tyr Thr Ala Val Leu Phe Ala His Ile
 210 215 220
 Tyr Leu Val Pro Leu Ala Leu Ile Val Val Met Tyr Val Arg Ile Ala
 225 230 235 240
 Arg Lys Leu Cys Gln Ala Pro Gly Pro Ala Arg Asp Thr Glu Glu Ala
 245 250 255
 Val Ala Glu Gly Arg Thr Ser Arg Arg Ala Arg Val Val His
 260 265 270
 Met Leu Val Met Val Ala Leu Phe Phe Thr Leu Ser Trp Leu Pro Leu
 275 280 285
 Trp Val Leu Leu Leu Ile Asp Tyr Gly Glu Leu Ser Glu Leu Gln
 290 295 300
 Leu His Leu Leu Ser Val Tyr Ala Phe Pro Leu Ala His Trp Leu Ala
 305 310 315 320
 Phe Phe His Ser Ser Ala Asn Pro Ile Ile Tyr Gly Tyr Phe Asn Glu
 325 330 335
 Asn Phe Arg Arg Gly Phe Gln Ala Ala Phe Arg Ala Gln Leu Cys Trp
 340 345 350
 Pro Pro Trp Ala Ala His Lys Gln Ala Tyr Ser Glu Arg Pro Asn Arg
 355 360 365
 Leu Leu Arg Arg Arg Val Val Val Asp Val Gln Pro Ser Asp Ser Gly
 370 375 380
 Leu Pro Ser Glu Ser Gly Pro Ser Ser Gly Val Pro Gly Pro Gly Arg
 385 390 395 400
 Leu Pro Leu Arg Asn Gly Arg Val Ala His Gln Asp Gly Pro Gly Glu
 405 410 415
 Gly Pro Gly Cys Asn His Met Pro Leu Thr Ile Pro Ala Trp Asn Ile
 420 425 430

<210> 38
 <211> 1299
 <212> DNA
 <213> Rat

<400> 38
 atggaggcgg agccctccca gcctcccaac ggcagctggc ccctgggtca gaacgggagt 60
 gatgtggaga ccagcatggc aaccagcctc accttctcct cctactacca acactcctct 120
 ccggtggcag ccatgttcat cgcggcctac gtgtctcatct tcctcctctg catggtgggc 180
 aacaccctgg tctgttcat tctgtctcaag aaccggcaca tgcgcactgt caccaacatg 240
 tttatcctca acctggccgt cagcgacctg ctggtgggca tcttctgcat gccacaacc 300
 ctgtgtggaca accttatcac tggttggcct ttgacaacg ccacatgcaa gatgagcggc 360
 ttggtgcagg gcatgtccgt gtctgcatcg gttttcacac tgggtggccat cgctgtggaa 420
 aggttccgct gcatcgtgca ccttttccgc gagaagctga cccttcggaa ggcgtgttc 480
 accatcgagg tgatctgggc tctggcgctg ctcatcatgt gtccctcggc ggtcactctg 540
 acagtcaccg gagaggagca tcacttcatg ctggatgctc gtaaccgctc ctaccgctc 600
 tactcgtgct gggaggcctg gcccgagaag ggcattgcga aggtctacac cgcggtgctc 660
 ttgcgcaca tctacctggt gccgctggcg ctcatcgtag tgatgtacgt gcgcatcgcg 720
 cgcaagctat gccaggcccc cggctctgcg cgcgacacgg aggaggcggg gcccgagggt 780
 ggccgcactt cgcgccgtag ggcggcggtg gtgcacatgc tggatcatgt ggcgtcttc 840
 ttcacgttgt cctggctgcc actctgggtg ctgctgctgc tcatcgacta tggggagctg 900
 agcgaagtgc aactgcacct gctgtcggtc tacgccttcc ccttggcaca ctggctggcc 960
 ttcttcaca gcagcgccaa ccccatcatc tacggctact tcaacgagaa ctccgccgc 1020
 ggcttccagg ctgccttccg tgcacagctc tgctggcctc cctgggccgc ccacaagcaa 1080
 gcctactcgg agcggcccaa cgccttctg cgcaggcggg tgggtgtgga cgtgcaacct 1140
 agcgactcgg gcttgccatc agagtctggc cccagcagcg ggggtccagg gcctggccgg 1200
 ctgccactgc gcaatggcg tgtggcccat caggatggcc cgggggaagg gccaggctgc 1260
 aaccacatgc ccctcacat cccggcctgg aacatttga 1299

<210> 39
 <211> 12
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> the C-terminus of the polypeptide is amide (-CONH2) form

<400> 39
 Met Pro His Ser Phe Ala Asn Leu Pro Leu Arg Phe
 1 5 10

<210> 40
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> the C-terminus of the polypeptide is amide (-CONH2) form

<400> 40
Val Pro Asn Leu Pro Gln Arg Phe
1 5

<210> 41
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> the C-terminus of the polypeptide is amide (-CONH2) form

<400> 41
Ser Ala Gly Ala Thr Ala Asn Leu Pro Arg Ser
1 5 10

<210> 42
<211> 36
<212> DNA
<213> Human

<400> 42
atgccacact ccttcgccaa ctigccattg agattt 36

<210> 43
<211> 36
<212> DNA
<213> Human

<400> 43
agtgcctggag caacagccaa cctgcctctg agatct 36

<210> 44
<211> 24
<212> DNA
<213> Human

<400> 44
gttcctaacc tgcccaaaag gitt 24

<210> 45
<211> 276
<212> DNA
<213> Human

<400> 45
atggaaatta tttcatcaaa actattcatt ttattgactt tagccacttc aagcttgta 60
acatcaaaca ttttttgtgc agatgaatta gtgatgtcca atcttcacag caaagaaaat 120
tatgacaaat attctgagcc tagaggatac ccaaaagggg aaagaagcct caattttgag 180
gaattaaaag attggggacc aaaaaatgtt attaagatga gtacacctgc agtcaataaa 240
atgccacact ccttcgccaa ctigccattg agatttggga ggaacgttca agaagaaaga 276

<210> 46
<211> 336
<212> DNA
<213> Human

<400> 46
atggaaatta tttcatcaaa actattcatt ttattgactt tagccacttc aagcttgta 60
acatcaaaca ttttttgtgc agatgaatta gtgatgtcca atcttcacag caaagaaaat 120
tatgacaaat attctgagcc tagaggatac ccaaaagggg aaagaagcct caattttgag 180
gaattaaaag attggggacc aaaaaatgtt attaagatga gtacacctgc agtcaataaa 240
atgccacact ccttcgccaa ctigccattg agatttggga ggaacgttca agaagaaaga 300
agtgcctggag caacagccaa cctgcctctg agatct 336

<210> 47
<211> 393
<212> DNA
<213> Human

<400> 47
atggaaatta tttcatcaaa actattcatt ttattgactt tagccacttc aagcttgta 60
acatcaaaca ttttttgtgc agatgaatta gtgatgtcca atcttcacag caaagaaaat 120
tatgacaaat attctgagcc tagaggatac ccaaaagggg aaagaagcct caattttgag 180
gaattaaaag attggggacc aaaaaatgtt attaagatga gtacacctgc agtcaataaa 240
atgccacact ccttcgccaa ctigccattg agatttggga ggaacgttca agaagaaaga 300

agtgctggag caacagccaa cctgcctctg agatctgga agaaatatgga ggtgagcctc 360
gtgagacgtg ttccctaacct gccccaaagg ttt 393

<210> 48
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 48
ccctggggct tcttctgtct tctatgt 27

<210> 49
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 49
agcgattcat tttattgact ttagca 26

<210> 50
<211> 203
<212> PRT
<213> Rat

<400> 50
Met Glu Ile Ile Ser Ser Lys Arg Phe Ile Leu Leu Thr Leu Ala Thr
1 5 10 15
Ser Ser Phe Leu Thr Ser Asn Thr Leu Cys Ser Asp Glu Leu Met Met
20 25 30
Pro His Phe His Ser Lys Glu Gly Tyr Gly Lys Tyr Tyr Gln Leu Arg
35 40 45
Gly Ile Pro Lys Gly Val Lys Glu Arg Ser Val Thr Phe Gln Glu Leu
50 55 60
Lys Asp Trp Gly Ala Lys Lys Asp Ile Lys Met Ser Pro Ala Pro Ala
65 70 75 80
Asn Lys Val Pro His Ser Ala Ala Asn Leu Pro Leu Arg Phe Gly Arg
85 90 95
Asn Ile Glu Asp Arg Arg Ser Pro Arg Ala Arg Ala Asn Met Glu Ala
100 105 110
Gly Thr Met Ser His Phe Pro Ser Leu Pro Gln Arg Phe Gly Arg Thr
115 120 125
Thr Ala Arg Arg Ile Thr Lys Thr Leu Ala Gly Leu Pro Gln Lys Ser
130 135 140
Leu His Ser Leu Ala Ser Ser Glu Leu Leu Tyr Ala Met Thr Arg Gln
145 150 155 160
His Gln Glu Ile Gln Ser Pro Gly Gln Glu Gln Pro Arg Lys Arg Val
165 170 175
Phe Thr Glu Thr Asp Asp Ala Glu Arg Lys Gln Glu Lys Ile Gly Asn
180 185 190
Leu Gln Pro Val Leu Gln Gly Ala Met Lys Leu
195 200

<210> 51
<211> 609
<212> DNA
<213> Rat

<400> 51
atggaaatta ttcatcaaa gcgattcatt ttattgactt tagcaacttc aagcttctta 60
acttcaaaca cctttgttc agatgaatta atgatgcccc attttcacag caaagaaggt 120
tatggaaaat attaccagct gagaggaatc ccaaaagggg taaaggaaag aagtgtcact 180
tttcaagaac tcaaagattg gggggcaaaag aaagatatga agatgagtc agcccttgcc 240
aacaagaatgc ccactcagc agccaacctt ccctgaggt tteggaggaa catagaagac 300
agaagaagcc ccagggcacg ggccaacatg gaggcaggga ccatgagcca ttttccagc 360
ctgcccaaaa ggtttgggag aacaacagcc agacgcacat ccaagacact ggctggtttg 420
ccccagaaat cctgcactc cctggcctcc agtgaattgc tctatgccat gacccgccag 480
catcaagaaa ttcagagtc tggtaagag caacctagga aacgggtgtt cacggaaaca 540
gatgatgcag aaaggaaaca agaaaaata ggaaacctcc agccagtcct tcaaggggct 600
atgaagctg 609

<210> 52

<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 52
ttctagattt tggacaaaat ggaaatt

27

<210> 53
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 53
cgtctttagg gacaggctcc agatttc

27

<210> 54
<211> 430
<212> PRT
<213> Human

<400> 54
Met Glu Gly Glu Pro Ser Gln Pro Pro Asn Ser Ser Trp Pro Leu Ser
1 5 10 15
Gln Asn Gly Thr Asn Thr Glu Ala Thr Pro Ala Thr Asn Leu Thr Phe
20 25 30
Ser Ser Tyr Tyr Gln His Thr Ser Pro Val Ala Ala Met Phe Ile Val
35 40 45
Ala Tyr Ala Leu Ile Phe Leu Leu Cys Met Val Gly Asn Thr Leu Val
50 55 60
Cys Phe Ile Val Leu Lys Asn Arg His Met His Thr Val Thr Asn Met
65 70 75 80
Phe Ile Leu Asn Leu Ala Val Ser Asp Leu Leu Val Gly Ile Phe Cys
85 90 95
Met Pro Thr Thr Leu Val Asp Asn Leu Ile Thr Gly Trp Pro Phe Asp
100 105 110
Asn Ala Thr Cys Lys Met Ser Gly Leu Val Gln Gly Met Ser Val Ser
115 120 125
Ala Ser Val Phe Thr Leu Val Ala Ile Ala Val Glu Arg Phe Arg Cys
130 135 140
Ile Val His Pro Phe Arg Glu Lys Leu Thr Leu Arg Lys Ala Leu Val
145 150 155 160
Thr Ile Ala Val Ile Trp Ala Leu Ala Leu Ile Met Cys Pro Ser
165 170 175
Ala Val Thr Leu Thr Val Thr Arg Glu Glu His His Phe Met Val Asp
180 185 190
Ala Arg Asn Arg Ser Tyr Pro Leu Tyr Ser Cys Trp Glu Ala Trp Pro
195 200 205
Glu Lys Gly Met Arg Arg Val Tyr Thr Thr Val Leu Phe Ser His Ile
210 215 220
Tyr Leu Ala Pro Leu Ala Leu Ile Val Val Met Tyr Ala Arg Ile Ala
225 230 235 240
Arg Lys Leu Cys Gln Ala Pro Gly Pro Ala Pro Gly Gly Glu Glu Ala
245 250 255
Ala Asp Pro Arg Ala Ser Arg Arg Arg Ala Arg Val Val His Met Leu
260 265 270
Val Met Val Ala Leu Phe Phe Thr Leu Ser Trp Leu Pro Leu Trp Ala
275 280 285
Leu Leu Leu Ile Asp Tyr Gly Gln Leu Ser Ala Pro Gln Leu His
290 295 300
Leu Val Thr Val Tyr Ala Phe Pro Phe Ala His Trp Leu Ala Phe Phe
305 310 315 320
Asn Ser Ser Ala Asn Pro Ile Ile Tyr Gly Tyr Phe Asn Glu Asn Phe
325 330 335
Arg Arg Gly Phe Gln Ala Ala Phe Arg Ala Arg Leu Cys Pro Arg Pro
340 345 350
Ser Gly Ser His Lys Glu Ala Tyr Ser Glu Arg Pro Gly Gly Leu Leu
355 360 365
His Arg Arg Val Phe Val Val Val Arg Pro Ser Asp Ser Gly Leu Pro
370 375 380
Ser Glu Ser Gly Pro Ser Ser Gly Ala Pro Arg Pro Gly Arg Leu Pro
385 390 395 400

Leu Arg Asn Gly Arg Val Ala His His Gly Leu Pro Arg Glu Gly Pro
 405 410 415
 Gly Cys Ser His Leu Pro Leu Thr Ile Pro Ala Trp Asp Ile
 420 425 430

<210> 55
 <211> 1290
 <212> DNA
 <213> Human

<400> 55
 atggaggggg agccctccca gcctcccaac agcagttggc ccctaagtca gaatgggact 60
 aacactgagg ccaccccggc tacaaacctc accttctcct cctactatca gcacacctcc 120
 cctgtggcgg ccatgtttcat tgtggcctat gcgctcatct tcctgctctg catgggtggc 180
 aacaccctgg tctgtttcat cgtgctcaag aaccggcaca tgcatactgt caccaacatg 240
 ttcatcctca acctggctgt cagtacacgt ctgggtggca tcttctgcat gcccaccacc 300
 ctgtgggaca acctcatcac tgggtggccc ttcgacaatg ccacatgcaa gatgagcggc 360
 ttgttgcagg gcatgtctgt gtcggcttcc gttttcacac tgggtggccat tgcgttggaa 420
 aggttccgct gcatcgtgca cccittccgc gagaagctga ccttgcggaa ggcgctcgtc 480
 accatcgccg tcatctgggc cctggcgtg ctcatcatgt gtccctcggc cgtcacgctg 540
 accgtcaccg gtgaggagca ccacttcatg gtggacggcc gcaaccgctc ctaccctctc 600
 tactctgtct gggaggcctg gcccgagaag ggcatgcgca gggcttacac cactgtgctc 660
 ttctcgacac tctacctggc gccgctggcg ctcatcgtgg tcatgtacgc ccgcatcgcg 720
 cgcaagctct gccaggcccc gggcccgggc cccggggggc aggaggctgc ggaccgcgca 780
 gcatcgcgcg gcagagcgcg cgtgtgtcac atgctggcca tgggtggcgt gtcttctacg 840
 ctgtcttggc tggcgctctg ggcgctgctg ctgctcatcg actacgggca gctcagcgcg 900
 ccgacagctg acctggtcac cgtctacgcc ttcccttctg cgcactggct ggccttcttc 960
 aacagcagcg ccaaccctat catctacggc tacttcaacg agaacttccg ccgcggttcc 1020
 caggccgctt tccgcgcccg cctctgcccc cgcccgctcg ggagccacaa ggaggcctac 1080
 tccgagcgcg ccggcgggct tctgcacagg cgggtcttct tgggtgttgc gcccagcgac 1140
 tccgggctgc cctctgagtc gggccctagc agtggggccc ccaggcccg ggccttccc 1200
 ctgcgggaatg ggcgggtggc tcaccacggc ttgccaggg aagggcctgg ctgctccac 1260
 ctgccctca ccattccagc ctgggatatc 1290

<210> 56
 <211> 1290
 <212> DNA
 <213> Human

<400> 56
 atggaggggg agccctccca gcctcccaac agcagttggc ccctaagtca gaatgggact 60
 aacactgagg ccaccccggc tacaaacctc accttctcct cctactatca gcacacctcc 120
 cctgtggcgg ccatgtttcat tgtggcctat gcgctcatct tcctgctctg catgggtggc 180
 aacaccctgg tctgtttcat cgtgctcaag aaccggcaca tgcatactgt caccaacatg 240
 ttcatcctca acctggctgt cagtacacgt ctgggtggca tcttctgcat gcccaccacc 300
 ctgtgggaca acctcatcac tgggtggccc ttcgacaatg ccacatgcaa gatgagcggc 360
 ttgttgcagg gcatgtctgt gtcggcttcc gttttcacac tgggtggccat tgcgttggaa 420
 aggttccgct gcatcgtgca cccittccgc gagaagctga ccttgcggaa ggcgctcgtc 480
 accatcgccg tcatctgggc cctggcgtg ctcatcatgt gtccctcggc cgtcacgctg 540
 accgtcaccg gtgaggagca ccacttcatg gtggacggcc gcaaccgctc ctaccgctc 600
 tactctgtct gggaggcctg gcccgagaag ggcatgcgca gggcttacac cactgtgctc 660
 ttctcgacac tctacctggc gccgctggcg ctcatcgtgg tcatgtacgc ccgcatcgcg 720
 cgcaagctct gccaggcccc gggcccgggc cccggggggc aggaggctgc ggaccgcgca 780
 gcatcgcgcg gcagagcgcg cgtgtgtcac atgctggcca tgggtggcgt gtcttctacg 840
 ctgtcttggc tggcgctctg ggcgctgctg ctgctcatcg actacgggca gctcagcgcg 900
 ccgacagctg acctggtcac cgtctacgcc ttcccttctg cgcactggct ggccttcttc 960
 aacagcagcg ccaaccctat catctacggc tacttcaacg agaacttccg ccgcggttcc 1020
 caggccgctt tccgcgcccg cctctgcccc cgcccgctcg ggagccacaa ggaggcctac 1080
 tccgagcgcg ccggcgggct tctgcacagg cgggtcttct tgggtgttgc gcccagcgac 1140
 tccgggctgc cctctgagtc gggccctagc agtggggccc ccaggcccg ggccttccc 1200
 ctgcgggaatg ggcgggtggc tcaccacggc ttgccaggg aagggcctgg ctgctccac 1260
 ctgccctca ccattccagc ctgggatatc 1290

<210> 57
 <211> 31
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 57
 gtcgacatgg agggggagcc ctccagcct c

<210> 58
 <211> 29
 <212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 58

actagttcag atatcccagg ctggaatgg

29

<210> 59

<211> 58

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 59

tatgagcctg aactttgaag aactgaaaga ttggggtcgg aaaaatgtga ttaaaatg

58

<210> 60

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 60

agcaccgccg cggatgaataa aatgccgcat agctttgcga atctgccgct gcgtttttgc

60

c

61

<210> 61

<211> 62

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 61

ggatgctcatt ttaatcacat ttttcggacc ccaatctttc agttcttcaa agttcaggct

60

ca

62

<210> 62

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 62

tcggggcaaa aacgcagcgg cagattcgca aagctatgcg gcattttatt caccgccgg

59